Permal assignment

Q.M:-

1) Both statements are correct.

2) $x \geq 1$

$x \geq 1 = 1 - (x = 0)$

combination ← C p q → failure

↓ success

(Binomial)

$x \geq 1 = 1 - (7C0 \times (1/2)^0 \times (1/2)^7)$

$= 1 - 0.0078125$

$= 0.992$

3) $n = 6$

Naina = 9%, Maina = 10%

$(A = P(1+r)^n)$

$= P(1+10\%)^6 - P(1+9\%)^6$

$= (1+10\%)^6 - (1+9\%)^6$

$= 0.094 \times 100$

$= 9.4\%$

4) Dice = 6 sides

$x \geq 1$

$x \geq 1 = 1 - (x = 0)$

$= 1 - ((1/6)^0 \times (5/6)^5 \times 5C0)$

$= 1 - 0.4018$

$= 0.598.$

5) Both statements are correct.

6) 63000, 70000, 68000, 72000, 78000, 63000, 65000, 75000

Arrange.

63000, 63000, 65000, [redacted], 68000, 70000, 72000, 75000, 78000

→ Mode → 63000

→ Median → $= \frac{68000+70000}{2}$

$= 69000$

7) Both statements are correct.

8) Both statements are correct.

9)

O	E	$(O-E)^2$	$(O-E)^2/E$
64	60	16	0.267
144	120	576	4.8
192	220	784	3.564

$\chi^2 = 8.631$

★ Chi-square $= \chi^2 = \Sigma\left(\frac{(O-E)^2}{E}\right)$

10) $n = 100$ $\mu = 11025$

$\bar{x} = 11418$

$\sigma = 1775$

Level of significance = 1%

11)

12)

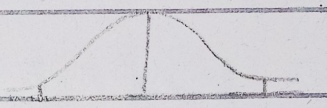
$n > 30$ Z-test S.D given

$n < 30$ t-test S.D find

$$Z = \frac{\bar{x} - \mu_0}{\frac{\sigma}{\sqrt{n}}}$$

$$= \frac{11418 - 11025}{\frac{1775}{\sqrt{100}}}$$

$$= 2.214$$



Total = 1

level of confidence = 99%.

$$= \frac{0.99}{2} = 0.495.$$

★ Table value = 2.57.

11) Only case ii is correct.

i) $H_0 <$ $H_1 \geq$

ii) $H_0 >$ $H_1 \leq$

iii) $H_0 =$ $H_1 \neq$ /

12) 4.5, 4.9, 5.2, 5.6, 6.2

level of significance = 99%.

$\bar{x} = 5.28$ level of confidence = 99%.

(by calculator)

$n = 5$, (T-Test)

$= \bar{x} \pm t \times \frac{\sigma}{\sqrt{n}}$

$\left(t\frac{\alpha}{2}(n-1) = t\left(\frac{0.01}{2}\right)(5-1) \right.$

$= t\,(0.005)(4)$

$= 4.604$ → from table) /

$= 5.28 \pm 4.604 \times \frac{0.653}{\sqrt{5}}$

$= 5.28 \pm 1.344$

$= 5.28+1.344 , 5.28-1.344$

$= \underline{6.6} , \underline{3.94}$

13) Standard error $= \frac{\frac{1}{\sqrt{n}} - \frac{1}{\sqrt{n}}}{\frac{1}{\sqrt{n}}}$

$= \frac{\frac{1}{\sqrt{10}} - \frac{1}{\sqrt{100}}}{\frac{1}{\sqrt{10}}}$

$= 0.68 \times 100$

$= 68.38\%$

15) Both statements are correct.

16) Both statements are NOT correct.

17)

	undefected	
Auto battery	22	3
Defective	3	2
Total	25	5

$(x = 2)$

$$P(x=2) = \frac{3C2 \times 22C3}{25C5}$$

$$= 0.0869$$

18) 2 order in 4 min. $\mu = 2$ (4)

4 order in 8 min. $\mu = 4$ (8)

$x \geq 5$

$$P.D = \frac{e^{-\mu} \mu^x}{x!}$$

$$P(x \geq 5) = 1 - (x < 5)$$

$$= 1 - \left(\frac{e^{-4} 4^0}{0!} + \frac{e^{-4} 4^1}{1!} + \frac{e^{-4} 4^2}{2!} + \frac{e^{-4} 4^3}{3!} + \frac{e^{-4} 4^4}{4!}\right)$$

$$= 1 - \left(e^{-4}\left(\frac{4^0}{0!} + \frac{4^1}{1!} + \frac{4^2}{2!} + \frac{4^3}{3!} + \frac{4^4}{4!}\right)\right)$$

$= 1 - 0.6288.$

$= 0.3711$

19) $\bar{x} = 5.15$

$S.D = 0.05$

$x = 5\,kg$

$z = \frac{x - \bar{x}}{S.D}$

$= \frac{5 - 5.15}{0.05}$

$= -3$

$P(-3) = 0.0013$

20)

red	black	Total
5	7	12
2	0	2

$P(x=2) = \frac{^5C_2 \times {}^7C_0}{^{12}C_2} = 0.1515$

21) $P(A \text{ or } B) = P(A) + P(B)$

$= 0.5 + 0.4$

$= 0.9$

22) Only statement ii is correct.

23) Only statement ii is correct.

24) $\overset{5}{\star}\ \star\ \star\ \overset{3}{\star}$

$= \frac{1}{7} \times \frac{10}{10} \times \frac{10}{10} \times \frac{1}{10}$

$= \frac{1}{70}$

1 2 3
4 5 6
7 8 9
0

25) Dice = 6 sides

$x \geq 1$

$x \geq 1 = 1 - (x = 0)$

$= 1 - (5C0 \times (1/6)^0 \times (5/6)^5)$

$= 1 - 0.4018$

$= 0.5982.$

26) $b = \frac{n\Sigma xy - \Sigma x \Sigma y}{n\Sigma x^2 - (\Sigma x)^2}$

$= \frac{6 \times 2851 - (75)(225)}{6 \times 625 - (75)^2}$

$b = -0.12$

$y = a + bx$

$a = \bar{y} - b\bar{x}$

$a = \frac{225}{6} - (-0.12)(75/6)$

$a = 39$

$y = 39 - 0.12x$

27) Laspeyre's formula.

$\frac{pn}{p_0}$ (2017 base year)

$2017 = \frac{3700}{3700} \times 100 = 100$

$2018 = \frac{4500}{3700} \times 100 = 121.62$

28)

29)

30)

31)

$2019 = \frac{4800}{3700} \times 100 = 129.73$

$2020 = \frac{5000}{3700} \times 100 = 135.14$

$2021 = \frac{5300}{3700} \times 100 = 143.24$

28) Both statements are not correct. ✗

29) Only i is correct.

30) Both statements are not correct.

31)

year	Cashflow
1	$5 \times 10\% = 0.5$
2	$5 \times 12\% = 0.6$
3	$5 \times 14\% = 0.7 + 5$
	$= 5.7$

$$NPV = \frac{0.5}{(1+10\%)^1} + \frac{0.6}{(1+10\%)^2} + \frac{5.7}{(1+10\%)^3}$$

$$= 5.23291$$

$NPV = \text{inflow} - \text{outflow}$

$= 5.23291 - 5$

$= 0.23291\ m$

32)

P	S	B	KPK	Total
S	4	2	2	13
O				

$$P(x=4) = \frac{4C0 \times 8C4}{13C4}$$

$$= \frac{1 \times 70}{715}$$

$$= 0.0979 \times 100$$

$$= 9.79\%$$

33) $$S.E = \frac{1}{\sqrt{n}} - \frac{1}{\sqrt{n}}$$

$$\frac{1}{\sqrt{n}}$$

$$= \frac{1}{\sqrt{95}} - \frac{1}{\sqrt{90}} = 0.2472$$

$$\frac{1}{\sqrt{90}}$$

$$= 24.72\%$$

34) $n = 8$

Tom = 9%, Jerry = 10%.

$$= (1+10\%)^8 - (1+9\%)^8$$

$(A = P(1+r)^n)$

$$= 0.1510 \times 100$$

$$= 15.10\%$$

Total
13

35) Both statements are correct.

36)

red	black	Total
5	7	12
0	2	2

$$P(x=2) = \frac{7C2}{12C2}$$

$$= 0.3182.$$

37) Only statement ii is correct.

38) $4(x+y) = xy$ $\quad 12(x-y) = xy$

$4x+4y$ $\quad 12x-12y = xy$

$4x = xy-4y$, $\quad 12x = xy+12y$

39) $x+10 = 11x^2 - x + 1$

$0 = 11x^2 - x - x + 1 - 10$

$0 = 11x^2 - 2x - 9$

$11x^2 - 2x - 9 = 0$

$x = 1$, $\quad x = 0.8181.$

40) $S = \frac{n}{2}\{2a_1 + (n-1)d\}$

$a = 1000$

$d = 500$

$45000 = \frac{n}{2}(2(1000) + (n-1)500)$

$45000 = \frac{n}{2}(2000 + 500n - 500)$

$n = 12$.

41) from calculator.

$= 1.6$.

42) $A = P(1+r)^n$

$A = 20000(1+12\%)^3$

$= 28098.56$

43) $G.M = \sqrt[3]{7 \times 14 \times 21}$

$= 12.71$

44) Both statements are not correct.

45) $C.I = R((1+r)^n - 1)$

$0.5 = 1.5((1+r\%)^4 - 1)$

$r = 7.45\%$

46) end of year

ordinary annuity

$\left(S = \frac{R(1+i)^n - 1}{i} \right)$

$PV = \frac{R(1-(1+r)^n)}{r}$

$P.V = x\frac{(1-(1+12\%)^{-5}}{12\%}$

$P.V = x \times 3.6$

$P.V = 3.6x$.

47)

1000	500	Total
65	35	100
2	2	4
(2000)	(1000)	(3000)

$$P(x=4) = \frac{65C2 \times 35C2}{100C4}$$

$$= 0.3156$$

48) $S.I = P\gamma t$

$$750000 = 1000000 \times \gamma \times (4 + 10/12)$$

$$\gamma = 15.51\%$$

49) Both statements are correct.

50) Both statements are correct.

51) Claim: population proportion $= p < 0.7$ (H1)
$p \geq 0.7$ Ho

proportion S.D = 0.0092

sample proportion = 0.684 = $\hat{p}$

level of significance = 10%

$n > 30$

(one tail)

$$Z = \frac{\hat{p} - p}{\sqrt{pq/n}}$$

$\hat{p}$ = sample proportion

p = population proportion.

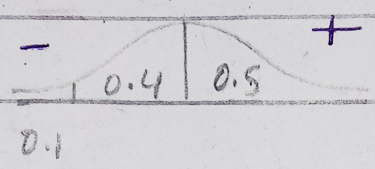
$$\sigma = \sqrt{pq/n}$$

$$Z = \frac{\hat{P} - P}{\sigma}$$

$$Z = \frac{0.684 - 0.7}{0.0092}$$

$$Z = -1.73$$

level of confidence = 90% = 0.9



$Z_{table} = -1.28$

(rejected.)

52)

year	cashflow
1	9x8% = 0.72
2	9x12% = 1.08
3	9x14% = 1.26+9 = 10.26

$\gamma = 9\%$

$$NPV = \frac{0.72}{(1+9\%)^1} + \frac{1.08}{(1+9\%)^2} + \frac{10.26}{(1+9\%)^3}$$

$$= 9.4921$$

$$NPV = 9.4921 - 9$$

$$= 0.4921m$$

53) Only statement i is correct.

54) Both statements are correct.

55) $= \frac{1}{8P3} \quad = \frac{1}{336}$

56) $\overset{5}{\star} \quad \star \quad \star \quad \overset{2}{\star}$

$= \frac{1}{8} \times \frac{10}{10} \times \frac{10}{10} \times \frac{1}{10}$

$= \frac{1}{80}$

57) $C \; p \; q$

$= 2C2 \times (1/6)^2 \times (5/6)^0$

$= \frac{1}{36} = 0.028$

58) $C \; p \; q$

$= 5C4 \times (0.85)^4 \times 0.15^1$

$= 0.3915 \times 100$

$= 39.15\%$

59) Only statement ii is correct.

60) i) $\left(1 + \left(\frac{7.15\%}{12}\right)^{12 \times 4}\right) - 1 = 0.33 = 33\%$

ii) $\left(1 + \left(\frac{7.23\%}{6}\right)^{6 \times 4}\right) - 1 = 0.3331 = 33.31\%$

iii) $\left(1 + \left(\frac{7.51\%}{4}\right)^{4 \times 4}\right) - 1 = 0.3466 = 34.6\%$

iv) $8.1\% \times 4 = 0.324 = 32.4\%$

S.D and V)

dispersion (M.D, Quartile .D, range,

61) Only statement is correct.

62) $n = 6$

Ali = 9%

Kashif = 10%

$(A = R(1+r)^n)$

$= (1+10\%)^6 - (1+9\%)^6$

$= 0.0944 \times 100$

$= 9.44\%$

63) $n = 6$

$r_1 = 10\%$

$r_2 = 8\%$

$C.I = (1+r)^n - 1$

$= ((1+10\%)^6 - 1) - ((1+8\%)^6 - 1)$

$= 0.1846$

0.5869

$= 0.3147 \times 100$

$= 31.47\%$

64) Total Contribution = Total revenue - Total V. Cost.

$= 550000 - 270000$

$= 280000$

65) Both statements are correct. ✓ ★

66)

67)

68) ★ i

ii

iii

iv

69)

B

70)

71)

72)

66) Only statement i is correct.

67) $S.D = \sqrt{\frac{\Sigma(x-\bar{x})^2}{n}}$

$= \sqrt{\frac{0.555}{5}}$

$= 0.333$

68) i) $(15\% \times 6) = 0.9 = 90\%$

ii) $(1+10\%)^6 - 1 = 0.7716 = 77.16\%$

iii) $(1+9\%/2)^{12} - 1 = 0.6959 = 69.59\%$

iv) $(1+8\%/12)^{48} - 1 = 0.6135 = 61.35\%$

69) Normal distribution $= \frac{x-\mu}{\sigma}$

Both statements are correct.

70) $A = P(1+r)^n$

$36300 = 30000(1+r)^2$

$r = 0.1 \times 100$

$r = 10.$

$30000(1.1)^3 = 39930$

71) $3x + 4 = 7$

72) $P = \frac{R}{r}(1+r)^{-n}$ $\quad n = 8$, $r = 5\%$

$P = \frac{400000}{5\%}(1+5\%)^{-8}$

$= 5414714$

$= 5.41m$

73) Mode → 21

74) Ayf = x Ali = y

$3x + 2y = 18000$

$3x - 2y = 15000$

$x = 5500$, $y = 750$

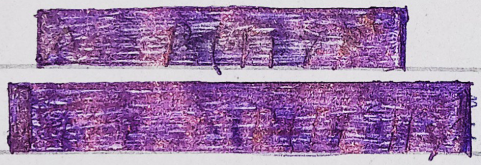
75) P(A and B) = ?

A and B = multiply

A or B = add

P(A and B) = $0.5 \times 0.4 = 0.2$

76)



Annuity ordinary

$$S = \frac{R(1+r)^n - 1}{r}$$

$$S = \frac{8000(1+11\%)^9 - 1}{11\%}$$

$S = 113311$

$A = P(1+r)^n$

$113311 = P(1+11\%)^{12}$

$P = 323889$

$P = 32389$

77)

O	E	$(O-E)^2$	$(O-E)^2/E$
64	50	196	3.92
88	75	169	2.25
348	375	729	1.944

$\chi^2 = 8.114$

$$\text{Chi-square} = \Sigma \frac{(O-E)^2}{E}$$

78) Both statements are correct.

79) $\sigma = 0.025$

$\mu = 5.05kg$

$x = 5.06kg$

$$z = \frac{x-\mu}{\sigma}$$

$$= \frac{5.06-5.05}{0.025}$$

$= 0.4$

$P(0.4) = 0.655 \times 100$

$= 65.5\%$

80) Both statements are correct

81) Only statement ii is correct

82) Only statements ii is correct.

83) Both statements are not correct.

84) Year Cashflow

1 $5 \times 12\% = 0.6m$

2 $5 \times 14\% = 0.7m$

3 $5 \times 16\% = 0.8 + 5 = 5.8m$

$$NPV = \frac{0.6}{(1+10\%)^1} + \frac{0.7}{(1+10\%)^2} + \frac{5.8}{(1+10\%)^3}$$

$$= 5.4815$$

$$NPV = 5.4815 - 5$$

$$= 0.4815m$$

85) $A = P(1+r)^{n \times m}$

$$2.5 = 2(1+7.51\%/m)^{3m}$$

$$m = 3.8 \Rightarrow 4$$

86) Annuity ordinary

$$P = R\left(\frac{1-(1+i)^{-n}}{i}\right)$$

$$= R\left(\frac{1-(1+10\%)^{-4}}{10\%}\right)$$

$$= 3.16R$$

87) $$P = R\left(\frac{1-(1+i)^{-n}}{i}\right)$$

$$= R\left(\frac{1-(1+9\%)^{-4}}{9\%}\right)$$

$$= 3.24R$$

88)

89)

90)

91)

88) 4.5, 4.9, 5.2, 5.6, 6.2

$\bar{x} = 5.28$

level of confidence = 95%

level of significance = 5%

$= \bar{x} \pm t \times \frac{\sigma}{\sqrt{n}}$

$= t_{\frac{\alpha}{2}}(n-1)$

$= t\ \frac{0.05}{2}(5-1)$

$= t\ (0.025)(4)$

$= 2.776$

$= 5.28 \pm 2.776 \times \frac{0.6534}{\sqrt{5}}$

$= 5.28 \pm 0.811$

$= 5.28 + 0.811,\ 5.28 - 0.811$

$= 6.091, 4.46$

89) Only case i is correct

90) Only statement ii is correct.

91) $F = \sqrt{\frac{\Sigma P_n q_0}{\Sigma P_0 q_0} \times \frac{\Sigma P_n q_n}{P_0 q_n}} \times 100$

$= \sqrt{\frac{60}{70.5} \times \frac{72}{73}} \times 100$

$= 0.9161 \times 100$

$= 91.61\%$

92) y on x

$y = a + bx$

$b = \frac{n\Sigma xy - \Sigma x \Sigma y}{n\Sigma x^2 - (\Sigma x)^2}$

$b = \frac{6 \times 1950 - (45)(280)}{6 \times 305 - (45)^2}$

$b = 4.61$

$a = \bar{y} - b\bar{x}$

$= \frac{280}{6} - (4.61)(45/6)$

$= 12.09$

$y = a + bx$

$y = 12.02 + 4.61x$

93) $\mu = 2$ 4min

$\mu = 4 + 0.5$ 9 min

$= 4.5$

$P.D = \frac{e^{-\mu} \mu^x}{x!}$ $x \geq 5$

$P(x \geq 5) = \frac{e^{-4.5} 4.5^x}{x!}$

$P(x \geq 5) = 1 - (x < 5)$

$= 1 - (e^{-4.5}(4.5^0/0! + 4.5^1/1! + 4.5^2/2! + 4.5^3/3! + 4.5^4/4!))$

$= 0.4679$

94) i) $11\% \times 5 = 0.55 = 55\%$

ii) $(1 + 8\%/4)^{20} - 1 = 0.4859 = 48.59\%$

iii) $(1 + 10\%)^5 - 1 = 0.6105 = 61.05\%$

iv) $(1 + 9\%/2)^{10} - 1 = 0.553 = 55.3\%$

95) Only statement i is correct.

96)

year	cashflow
1	$4 \times 10\% = 0.4$
2	$4 \times 12\% = 0.48$
3	$4 \times 14\% = 0.56 + 4 = 4.56$

$$NPV = \frac{0.4}{(1+12\%)^1} + \frac{0.48}{(1+12\%)^2} + \frac{4.56}{(1+12\%)^3}$$

$= 3.9855$

$NPV = 4 - 3.9855$

$NPV = (0.0144)m$

97) 2009 base year.

$2007 = \frac{3700}{4500} \times 100 = 82.22$

$2008 = \frac{4800}{4500} \times 100 = 106.6$

$2009 = \frac{4500}{4500} \times 100 = 100$

$2010 = \frac{4500}{4500} \times 100 = 100$

$2011 = \frac{5300}{4500} \times 100 = 117.77$

98) $(n = 100)$

$S.D = 5$

$\bar{x} = \pm 3$

confidence interval $= 95\% = \frac{0.95}{2}$

$= 0.475$

$$Z = \frac{\bar{x} - \mu_0}{\frac{\sigma}{\sqrt{n}}}$$

$$1.96 = \frac{3}{\frac{5}{\sqrt{n}}}$$

$n = 10.6 \approx 11$

99) 2008 base year

$2007 = \frac{3700}{4500} \times 100 = 82.22$

$2008 = \frac{4500}{4500} \times 100 = 100$

100)

101)

102)

103)

104)

105)

106)

107)

108)

109)

$2009 = \frac{4800}{4500} \times 100 = 106.67$

$2010 = \frac{5000}{4500} \times 100 = 111.11$

$2011 = \frac{5300}{4500} \times 100 = 117.78$

100) Both statements are not correct.

101) Both statements are correct.

102) Only statement ii is correct.

103) Both statements are correct.

104) Both statements are correct.

105) Only statement i is correct.

106) Only statement ii is correct.

107) Both statements are correct.

108) Both statements are not correct.

109)

R	B	Total
5	7	12
1	1	2

$P(x=2) = \frac{5P1 \times 7P1}{12P2}$

$= 0.2651$

110) Only statement i is correct.

111) $\bar{x} = 5.15kg$

$\sigma = 0.05kg$

$x = 5.05kg$

$$Z = \frac{x - \bar{x}}{\sigma}$$

$$Z = \frac{5.05 - 5.15}{0.05}$$

$$= -2$$

$P(-2) = 0.0227.$

112)

R	B	Total
6	9	15
1	1	2

$$P(x=2) = \frac{6P1 \times 9P1}{15P2}$$

$$= 0.2571$$

113)

P	S	KPR	B	Total
5	3	2	2	12
1	2	1	1	5

$$P(x=5) = \frac{5C1 \times 3C2 \times 2C1 \times 2C1}{12C5}$$

$$= 0.0757$$

$$= 7.57\%$$

$$= 7.6\%$$

114)

115)

116)

117)

114) Dice = 6 sides

$x \geq 1$.

$x \geq 1 = 1 - (x = 0)$

$= 1 - cpq$

$= 1 - (4C0 \times (1/6)^0 \times (5/6)^4)$

$= 1 - 0.4822$

$= 0.5177$

115) Dice = 6 sides.

$x \geq 1$

$x \geq 1 = 1 - (x = 0)$

$= 1 - cpq$

$= 1 - (2C0 \times (1/6)^0 \times (5/6)^2)$

$= 1 - 0.694$

$= 0.3055$

$= 0.306$

116) Mode -> 21 only

117) $n = 8$ years

$r = 8\%$

$R = 8000$

$P = \frac{R}{r} (1+r)^{-n}$

$P = \frac{8000}{8\%} (1+8\%)^{-8}$

$P = 54027$

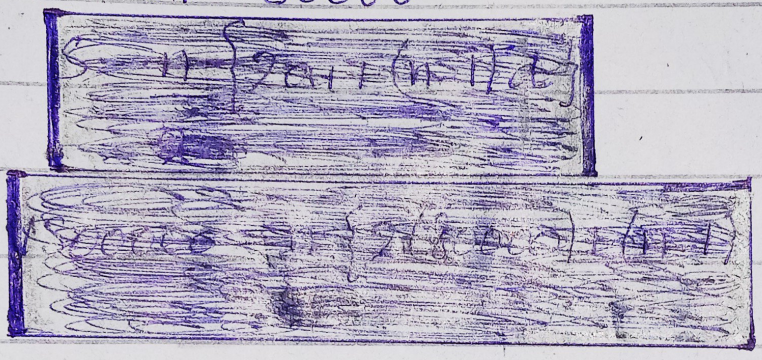
118) $S = \frac{n}{2}\{2a_1 + (n-1)d\}$

$288000 = \frac{24}{2}\{2a_1 + (24-1)1000\}$

$a_1 = 500$

119) $S = 1500000$, $r = 1.2$

$a_1 = 80000$



$S_n = \frac{a_1(r^n - 1)}{r - 1}$

$1500000 = \frac{80000(1.2^n - 1)}{1.2 - 1}$

$n = 8.5 \approx 9^{th}$.

120) $S = \frac{n}{2}\{2a_1 + (n-1)d\}$

$S = 426000$

$a_1 = 500$

$426000 = \frac{24}{2}\{2(500) + (24-1)d\}$

$d = 1500$

$a_n = a_1 + (n-1)d$

$a_{24} = 500 + (24-1)1500$

$a_{24} = 35000$

121) $\frac{25n - 500}{n} = 25$

$\frac{25n^2 - 500}{n} = 25$

$25n^2 - 500 = 25n$

$25n^2 - 25n - 500 = 0$

$n_1 = 5 \quad , \quad n_2 = -4$

122) Both statements are correct.

123) Only case i is correct.

124) $\frac{15n - 650}{n} = 15$

$\frac{15n^2 - 650}{n} = 15$

$15n^2 - 650 = 15n$

$15n^2 - 15n - 650 = 0$

$n_1 = 7.1 \quad , \quad n_2 = -6.1$

125)

Auto Battery	Defective	Total
	3	20
	2	5
un-defected		
17		
3		

$$P(x=2) = \frac{3C2 \times 17C3}{20C5}$$

$$= 0.1316$$

126) $$S.E = \frac{1}{\sqrt{n}} - \frac{1}{\sqrt{n}}$$

$$\frac{1}{\sqrt{n}}$$

$$= \frac{1}{\sqrt{45}} - \frac{1}{\sqrt{75}}$$

$$\frac{1}{\sqrt{45}}$$

$$= 0.225 \times 100$$

$$= 22.5\% \text{ decrease.}$$

127) Only statement i is correct

128) $n = 6$ years.

$(A = P(1+r)^n)$

$$= P(1+9\%)^6 - P(1+8\%)^6$$

$$= 0.090 \times 100$$

$$= 9.02\%$$

129) 28 → mode → only.

130) Only statement ii is correct.

131) $$S = \frac{n}{2}\{2a_1 + (n-1)d\}$$

132)

133)

134)

135)

136)

$$105000 = \frac{12}{2}\{2(500)+(12-1)d\}$$

$$d = 1500.$$

132) $$P = R\left(\frac{1-(1+r)^{-n}}{r}\right)$$

$$P = x\left(\frac{1-(1+13\%)^{-4}}{13\%}\right)$$

$$P = 2.97x$$

133) $4 \times 3 \times 3 \times 3 = 108$ ways.

134) $3(S-7) = F-7$

$3S-21 = F-7$

$3S-F = 14 \rightarrow (1$

$2(S+7) = F+7$

$2S+14 = F+7$

$2S-F = -7 \rightarrow (2$

$S = 21, F = 49.$

135) Both statements are correct.

136) $$H.M = \frac{n}{\Sigma 1/x}$$

$$= \frac{3}{0.25}$$

$$= 12.$$

137) IRR $\Rightarrow \frac{1}{(1+r)^1} + \frac{2}{(1+r)^2} + \frac{14.5}{(1+r)^3} = 15$

$\approx 5.73\%$

138) $A = P(1+r)^n$

$10 = P(1+8\%/4)^{40}$

$P = 4.89m$

(we will not divide 0.018 by 4 as it is the periodic rate not the nominal rate).

139) IRR $\Rightarrow \frac{1}{(1+r)^1} + \frac{5.2}{(1+r)^2} + \frac{0.85}{(1+r)^3} = 5$

$= 19.2\%$

140) (6250,0)(0,10000)(5000,2500)

$P = 250x + 375y$. (put values)

$= 3750000 \rightarrow$ max. profit.

(0,12500)(6666.67,0) → extra)

141) $150x + 300y$

$3x + y \leq 18000$

$2x + y \leq 24000$

$x, y \geq 0.$

142) $A = P(1+r)^n$

$A = 200000(1+13.5\%)^5$

$= 376712$

143) (4m)

IRR:

$4 = \frac{0.6}{(1+r)^1} + \frac{0.8}{(1+r)^2} + \frac{04}{(1+r)^3}$

$r = 0.1222$

$r = 12.22\%$

144) $P = \frac{R}{r}$

$= \frac{2500}{12\%/12} = \frac{2500 \times 12}{12\%}$

$= 250000$

145) $(x = 1)$ · (1 coin -> 1/2 -> 0.5)

$(n = 3)$

${}^nC_x \, p^x \, q^{n-1}$

$= 3C1 \times (0.5)^1 \times (0.5)^2$

$= 0.375$

146) $\mu = 6$ 4 minutes.

$x \geq 5$ 4 min.

$P.D = \frac{e^{-\mu} \mu^x}{x!}$

P.D = 1 - (x < 5)

x ≥ 5

$= 1-(e^{-6}(6^0/0! + 6^1/1! + 6^2/2! + 6^3/3! + 6^4/4!))$

$= 0.7149$

147) Only statement i is correct.

148) $250x + 350y$

$x + 3y \leq 1800$

$2x + y \leq 24000$

$x, y \geq 0$

149) $n = 6$ years

John = 9%

Johnson = 10%

$= ((1+10\%)^6 - 1) - ((1+9\%)^6 - 1)$

$= \frac{0.0944}{0.6771}$

$= 0.1394 \times 100$

$= 13.94.$

150) from calculator.

(S.D)

$= 1.095.$

151) $150x + 320y$

$3x + 2y \leq 25000$

$4x + y \leq 20000$

$x, y \geq 0$

$z = p < 5000$

152) Both statements are correct.

153) Both statements are not correct.

154) Both statements are correct.

155) IRR:

$$2 = \frac{0.1}{(1+x)^1} + \frac{0.2}{(1+x)^2} + \frac{2.3}{(1+x)^3}$$

$= 0.096 \times 100$

$= 9.6\%$

156)

year	cashflow	
1	0.3	$3 \times 10\%$
2	0.36	$3 \times 12\%$
3		$3 \times 14\% = 0.42 + 3 \rightarrow 3.42$

$$NPV = \frac{0.3}{(1+8\%)^1} + \frac{0.36}{(1+8\%)^2} + \frac{3.42}{(1+8\%)^3}$$

$= 3.3013$

$NPV = 3.3013 - 3$

$= 0.3013$ m.

EXTRA.

157)

1000	500	Total
65	35	100
2	2	4
(2000)	(1000)	(3000)

$$P(x=4) = \frac{65C2 \times 35C2}{100C4}$$

$$= 0.3156.$$

158) ★

$$= 4C2 \times (65/100)^2 \times (35/100)^2$$

$$= 0.3105.$$

158)

O	E = np	$(O-E)^2$	$(O-E)^2/E$
88	55.6	1049.76	18.88
188	222.4	1183.36	5.32
280	278	4	0.014
556			

$\chi^2_{cal} = 24.21$

Chi-square $= \Sigma \frac{(O-E)^2}{E}$

159)

$n = 3$

$x = 1.$

$${}^nC_x p^x q^{n-x}$$

$$= 3C1 \times (0.5)^1 \times (0.5)^2$$

$$= 0.375.$$

160)

S	B	P	HPH	Total
1	2	2	4	9
1	1	1	1	4

161)

162)

$$= \frac{{}^{1}C_{1} \times {}^{2}C_{1} \times {}^{2}C_{1} \times {}^{4}C_{1}}{{}^{9}C_{4}}$$

$$= 0.126 \times 100$$

$$= 12.6\%$$

161)

O	E	$(O-E)^2$	$(O-E)^2/E$
64	40	576	14.40
144	160	256	1.600
192	200	64	0.32

$\chi^2_{cal} = 16.32$

162) $(n = 100)$

$\sigma = 5$, $\mu = \pm 3$

level of confidence / confidence interval $= 99\%$

$$= \frac{0.99}{2} = 0.495$$

$$Z = \frac{\bar{x} - \mu}{\frac{\sigma}{\sqrt{n}}}$$

$$2.58 = \frac{3}{\frac{5}{\sqrt{n}}}$$

$$n = 18.49 \approx 19$$

163) A

164) $4x + 5y \leq 51000$

(12750, 10200)

$7x + 4y \leq 56000$

(8000, 14000)

(8000, 0) (0, 10200) (4000, 7000)

$P = 120x + 80y$ (put values)

$= 1040000$

165) B. $2x + 3y \leq 24$ (12, 8)

$3x + 5y \leq 45$ (15, 9)

$x \leq 4$

$x, y \geq 0$

166) $n = 5$

$x = 1$

$^{n}C_{x} \, p^{x} \, q^{n-x}$

$P(x=1) = 5C1 \times (0.07)^{1} \times (0.93)^{4}$

$= 0.2618 \times 100$

$= 26.18\%$

167) Mean and S.D both will increase by 15%.

168) $A = P(1 + rt)$

$156000 = 120000(1 + r \times 4)$

$r = 0.075 \times 100$

$r = 7.5\%$

$A = P(1+rt)$

$= 120000(1 + 7.5\% \times 3)$

$= 147000$

• The simple interest rate is 7.5%.

169) from calculator.

1.26 — Ans

170) P = Sales − cost

Bat = 1500 − 1100

= 400

Football = 3000 − 2300

= 700

$2B + 4F \leq 9000$ (45 × 2000)

$Z = 400B + 700F$

$1100B + 2300F \leq 5000000$

171) Only statement ii is correct.

172) Only statement i is correct.

173) $a_1 = 6000$

$S = \frac{n}{2}\{2a_1 + (n-1)d\}$

$S = \frac{13}{2}\{2(6000) + (13-1)300\}$

$S = 101400$

$a_{13} = a_1 + (n-1)d$

$= 6000 + (12)300$

$= 9600.$

Both statements are not correct.

174) Annuity due.

$$S = R\left(\frac{(1+i)^n - 1}{i}\right)(1+i)$$

$i = 7\%$

$$1000000 = R\left(\frac{(1+7\%)^9 - 1}{7\%}\right)(1+7\%)$$

$R = 78025$

175) x, y

$7x + 7y = xy$, $21x - 21y = xy$

$-7y = 7x - xy$, $xy + 21y = 21x$

176) $$\bar{x}_w = \frac{\sum wx}{\sum w}$$

$$\bar{x}_{w(1)} = \frac{(200\times80)+(170\times80)+(50\times64)+(20\times75)}{80+80+64+75}$$

$= 114.72$

$$\bar{x}_{w(2)} = \frac{(60\times80)+(80\times80)+(170\times64)+(140\times75)}{80+80+64+75}$$

$= 108.96$

177) x = Asif

y = kashif

$x + 7y = 9$

$x + 2y = 4$

2, 1 respectively

178) $5x + 3y = 8$

$3x - 2y = 1$

1, 1 respectively.

179) $S.E = \frac{S}{\sqrt{n}}$

$S\ (S.D) = \sqrt{\frac{\Sigma(x-\bar{x})^2}{n-1}}$

$= \sqrt{\frac{500}{49}}$

$= 3.19$

$S.E = \frac{3.19}{\sqrt{50}}$

$= 0.4511$

180) Medical students = 300

109 males

level of confidence = 98%

level of significance = 2%

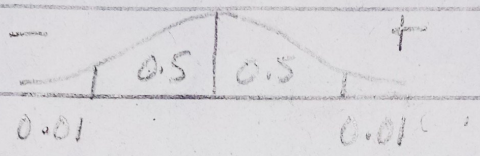
= 0.02

$$P.P(male) = P \pm \frac{z\alpha}{2} \times \sqrt{\frac{pq}{n}}$$

$$P = \frac{109}{300} = 0.3633$$

$$q = 1 - P = 0.6367$$

$$= \frac{z\alpha}{2} = \frac{0.02}{2} = 0.01$$



$$0.5 - 0.01 = 0.49$$

T-value $= \pm 2.33$

$$= 0.3633 \pm 2.33 \sqrt{\frac{0.3633 \times 0.6367}{300}}$$

$$= 0.3633 \pm 0.064$$

$$= 0.4273, 0.2993$$

$$= 42.73\%, 29.93\%$$

181) $\hat{i}$ NPV $= \frac{1}{(D.Rate) \downarrow}$

NPV = 26708 , $r = 13\%$

NPV = 35612 , $r = 11\%$

(d)

182) NPV = 6172 , $\gamma = 9\%$

NPV = 3291 , $\gamma = 12\%$

(C)

183) $IRR = A\% + \left(\frac{A}{A-B}\right) \times (B-A)\%$

$= 11\% + \left(\frac{2210}{2210-(-1918)}\right) \times (15\%-11\%)$

$= 0.1314 \times 100$

$= 13.14\%$

184) Dice = 6 sides

$= \frac{1}{6} \times \frac{1}{6} \times \frac{1}{6}$

$= \frac{1}{216}$

185) 4.8, 5.8, 5.2, 4.6, 6.2 , $\mu = 5.32$

confidence level = 99%

significance level = 1% , $\sigma = 0.6723$

$P.M = \mu \pm \tau \times \frac{\sigma}{\sqrt{n}}$

$= \tau \frac{\alpha}{2}(n-1) = \tau \frac{0.01}{2}(5-1)$

$= \tau(0.005)(4)$

$= 4.604 \rightarrow$ Table.

$= 5.28 \pm 4.604 \times \frac{0.6723}{\sqrt{5}}$

$= 5.28 \pm 1.38$

$= 6.66, 3.9$

$= 6.7, 3.9$

186) IRR:-

$$3 = \frac{0.8}{(1+r)^1} + \frac{1.2}{(1+r)^2} + \frac{1.8}{(1+r)^3}$$

$r = 0.1118$

$r = 11.18\%$

187) Annuity due.

$$S = R\left(\frac{(1+i)^n - 1}{i}\right)(1+i)$$

$$= 400000\left(\frac{(1+12\%/4)^{32} - 1}{12\%/4}\right)(1+12\%/4)$$

$= 21631137.$

188) y on x

$y = a + bx$

$$b = \frac{n\Sigma xy - \Sigma x \Sigma y}{n\Sigma x^2 - (\Sigma x)^2}$$

$$b = \frac{5 \times 1985 - (65)(315)}{5 \times 685 - (65)^2}$$

$b = 13.19$

189)

190)

191)

192)

$$\bar{y} = a + b\bar{x}$$

$$a = \bar{y} - b\bar{x}$$

$$a = \frac{315}{5} - 13.19\left(\frac{65}{5}\right)$$

$$a = -108.47$$

$$\bar{y} = 13.19 - 108.47$$

189) Sales − cost = 0.

$$16.8x - (-0.09x^2 + 1.8x + 5000) = 0$$

$$(16.8x + 0.09x^2 + 1.8x - 5000) = 0$$

$$0.09x^2 + 15x - 5000 = 0$$

$$x_1 = 166.6. \approx 167.$$

190) $A = P(1+r)^n$

$$A = 5(1+15\%)^{-10}$$

$$= 1.23m$$

191) Both statements are correct.

192) $A = P(1+r)^n$

$$6 = 5(1+r/4)^{12}$$

$$= 0.061$$

$$= 6.1\%$$

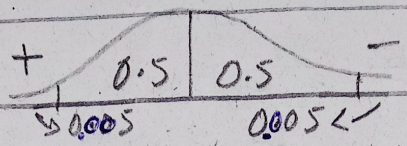
$$A = P(1+r)^n$$

$$A = 6\left(1+\frac{6.12\%}{4}\right)^{3\times 4}$$

$$A = 7.2m$$

193) C.level = 99% S.L = 1% = 0.01

n = 5.



$= t_{\frac{\alpha}{2}}(n-1)$

$= t\ \frac{0.01}{2}(5-1)$ (0.01/2 = 0.005)

$= t\ 0.005\ (4)$

$= 4.604 \rightarrow$ Table

194) Only statement i is correct

195) $IRR = A\% + \left(\frac{A}{A-B}\right) \times (B-A)\%$

$= 8\% + \left(\frac{5641}{5641+2354}\right) \times +2\%$

$= 0.0941 \times 100$

$= 9.41\%$

196) → S.R.S

(equal chances of selection)

→ Stratified S.

(sub-group, small group, partition)

→ Cluster sampling

(different clusters should be similar to each other.)

197) a, e, i, o, u — Permutations sequence.

LEADING
1 2 3 4 5 6 7

(EAI) LDNG
1 2 3 4 5

$= 5! \times 3!$

$= 720.$

05)

198) rational — irrational

ratio is — ratio is

(C)

199) Both statements are not correct.

200) Both statements are not correct.

201) Apple $= x$

Grapes $= y$

$x = 40 + y$

$1200 - 200 = 100$

$5x + 3y = 1000 \rightarrow (1$

$x = 40 + y$

$x - y = 40 \rightarrow (2$

$x = \underline{140}$, $y = \underline{100}$

(b)

202) Mean of sampling distribution.

203) Standard deviation of population.

204) Chair = x

Table = y

$3x + 8y = 1000 \rightarrow (1$

$5x + 6y = 1300 \rightarrow (2$

$x = 200, \quad y = 50.$

205) Both statements are correct.

206) Only statement i is correct.

207) Only statement ii is correct.

(mini population)

208)

Civic	City	Total
5	8	13
2	0	2

$$P(x=2) = \frac{5C2 \times 8C0}{13C2}$$

$$= 0.1282$$

209) NPV = NPV

$$\frac{0.6}{(1+x)^1} + \frac{0.9}{(1+x)^2} + \frac{1.2}{(1+x)^3} = \frac{0.6}{(1+x)^1} + \frac{0.75}{(1+x)^2} + \frac{0.85}{(1+x)^3} + \frac{0.9}{(1+x)^4}$$

$x = 54.65\%$

210) $I = PRT$

$= 500000 \times 1.5\% \times 12 \times 1$

$= 90000.$

(d) → 450000 after 5 years

211) $I = PRT$

$40000 = 600000 \times r \times 2 \times \frac{3}{12}$ $\left(24+3 = \frac{27}{12}\right)$

(2.25 → years)

$r = \frac{40000}{600000 \times 2.25 \text{ years}}$

$r = 0.0296 \times 100$

$r = 2.96\%$

212) $S = R\left(\frac{(1+i)^n - 1}{i}\right)(1+i)$

$200000 = R\left(\frac{(1+12\%/4)^4 - 1}{12\%/4}\right)(1+12\%/4)$

$R = 46413$

$S = R\left(\frac{(1+i)^n - 1}{i}\right)$

$S = 46413\left(\frac{(1+12\%/4)^4 - 1}{12\%/4}\right)$

$S = 194174.68$

213) $P = \frac{R}{r}$

$$500000 = \frac{20000}{r}$$

$r = 0.04 \times 100$

$r = 4\%$

214) $n = 10$ years

$A = R(1+i)^n$

$= 200000(1+6\%/4)^{4\times 10}$

$= 362803.$

ordinary annuity.

$S = R\left(\frac{(1+i)^n - 1}{i}\right)$

$= 20000\left(\frac{(1+6\%/4)^{40} - 1}{6\%/4}\right)$

$= 1085357$

Total $= 1085357 + 362803$

$= 1448160.$

215) $(\overset{\star}{\mu})\ \bar{x} = 5$

$\sigma = 0.3$

$x = 5 - 0.03 = 4.97$

$z = \frac{x - \bar{x}(\overset{\star}{\mu})}{\sigma}$

$z = \frac{4.97 - 5}{0.03}$

$z = -1$

$= 0.3413 \times 100$

$= 34.13\%$

2.16) $a_n = a_1 \cdot r^{n-1}$ (5th)

$a_n = x \times 1.2^{5-1}$ ($a_n = 51389$)

$51389 = x \times 1.2^4$

$x = 24782.5$.

2.17) Only statement ii is correct.

2.18) No. of children of an employee

2.19) $S.E = \frac{\sigma}{\sqrt{n}}$

(old S.E. $\frac{1}{\sqrt{9}} = \frac{1/2}{\sqrt{9}}$)

$S.E = \frac{18 \times 0.5}{\sqrt{9}}$

$S.E = 3$.

2.20) $\left(Z = \frac{x - \mu}{\sigma}\right)$

(both)

2.21) S.D of population.

2.22) Strong correlation.

2.23) High correlation.

224) Inverse of confidence level.

225) $a_n = a_1 + (n-1)d$

$2 = 0.2 + (n-1)0.2$

$n = 10$ months.

226) $6 \rightarrow 12 \quad 1500 \rightarrow 1200$

$18 \quad 2700$

$= \frac{1200}{6}$

$= 200$

227)

O	E	$(O-E)^2$	$(O-E)^2/E$
75	70	25	0.3571
90	84	36	0.4285
70	79	81	1.02
83	85	4	0.04

$\chi^2 cal = 1.845.$

228)

G	B	Total
12	18	30
2	2	/

$18C2 \times 12C2 = 10098.$

229) $A = P(1+r)^n$

$= 10000(1+8\%)^3$

$A = 12597.12(1+10\%)^3$

$= 16766.$

230) Not possible.

231) Fisher index is less than either paasche or laspeyre index. ★

232) no correct.

233) True

234)

6 <—	12	140000	-> 90000
	18	230000	

$$= \frac{90000}{6}$$

$$= 15000$$